

AIR FORCE QUALIFICATION TRAINING PACKAGE (AFQTP)



for
UTILITIES SYSTEMS
(3E4X1)

MODULE 11
PROJECT PLANNING

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Career Field Education and Training Plan (CFETP) references from 1 Apr 97 version.

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Notice. This AFQTP is NOT intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

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INTRODUCTION

Before starting this AFQTP, refer to and read the "Trainee/Trainer Guide" located on the AFCESA Web site <http://www.afcesa.af.mil/>

AFQTPs are mandatory and must be completed to fulfill task knowledge requirements on core and diamond tasks for upgrade training. **It is important for the trainer and trainee to understand** that an AFQTP ***does not*** replace hands-on training, nor will completion of an AFQTP meet the requirement for core task certification. AFQTPs will be used in conjunction with applicable technical references and hands-on training.

AFQTPs and Certification and Testing (CerTest) must be used as minimum upgrade requirements for Diamond tasks.

MANDATORY minimum upgrade requirements:

Core task:

AFQTP completion
Hands-on certification

Diamond task:

AFQTP completion
CerTest completion (80% minimum to pass)

Note: *Trainees will receive hands-on certification training for Diamond Tasks when equipment becomes available either at home station or at a TDY location.*

Put this package to use. Subject matter experts under the direction and guidance of HQ AFCESA/CEOT revised this AFQTP. If you have any recommendations for improving this document, please contact the Career Field Manager at the address below.

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USE BUILDING CONSTRUCTION PLANS TO IDENTIFY:

MODULE 11

AFQTP UNIT 1

INSTALLATION PROCEDURE (11.1.1.)

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INSTALLATION PROCEDURE***Task Training Guide***

STS Reference Number/Title:	11.1.1., Installation procedure
Training References:	<ul style="list-style-type: none"> • CDC 3E451A • AFJMAN 32-1059 • AFI 32-1066 • AFI 32-1070 • Uniformed Plumbing Code
Prerequisites:	<ul style="list-style-type: none"> • Possess as a minimum a 3E4X1 AFSC
Equipment/Tools Required:	<ul style="list-style-type: none"> • Construction plans
Learning Objective:	<ul style="list-style-type: none"> • Trainee will learn to use construction plans to identify proper installation procedures
Samples of Behavior:	<ul style="list-style-type: none"> • Trainee will be able to use construction plans to identify installation procedures
Notes:	
<ul style="list-style-type: none"> • Steps will be followed in sequence as needed • Any safety violation is an automatic failure 	

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INSTALLATION PROCEDURE

Background: The construction plans you will need to identify installation procedures are: plot plan, foundation plan, floor plan, elevation plan, and mechanical blueprints. From these plans we can identify where to start our installation, what size lines to install, what fixtures are needed, number of valves, and what fittings are required. These plans are used to identify where to install your rough-in (i.e. where your lines will come up through the foundation and stay inside the walls). Once you have completed your rough-in, you will be ready to install the fixtures, appliances and appurtenances parts of the building plumbing.

HINT:

A project manager will coordinate with each craft for each phase of the installation. You will need to ensure that you have all materials ready to avoid slowing down the project.

NOTE:

Use supplementary material foldout for CDC 3E451A volume 2 shows all the standard plumbing symbols used to identify piping material, fittings valves and fixtures.

To perform this task, follow these steps:

Step 1: Identify where to rough-in your plumbing system using a plot plan, also referred to as a site plan.

Step 2: By using the floor plan, elevation plan, and the plumbing plan you can identify the location, size, and type of line you will be installing.

Step 3: After framework of the structure is complete, you will then install building plumbing (vent stacks, water supply lines, and gas lines).

HINT:

Remember to refer to the legend so you will know what type (material) of piping system you will need to install; (i.e., PVC, Copper, or Iron pipe). This will also help you determine what kind of fittings you will use. Also, you can use Supplementary Material (foldout) from CDC 3E451A volume 2.

Step 4: Cap off water and gas lines and pressure test the system meet required specifications.

Step 5: After facility walls are finished (painted, textured, etc.) and vanities or kitchen counters are installed you will then install the plumbing fixtures referring to manufacturers specifications.

Step 6: After all fixtures have been set and their traps filled with water, their connections shall be tested and proved gas and water tight.

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Review Questions for Installation Procedure

Question	Answer
1. A legend on a drawing is used to?	<ul style="list-style-type: none"> a. Show the position of the building b. Point out possible problems c. Point out buildings d. Identify the different lines and symbols shown on the plan
2. A project manager will coordinate with each craft for each phase of the installation. You will need to ensure that you have all materials ready to avoid slowing down the project.	<ul style="list-style-type: none"> a. True b. False
3. After the framework is completed what is done next?	<ul style="list-style-type: none"> a. Install Roof b. Finish floors c. Install building plumbing d. Prep building plumbing
4. After building plumbing is completed what should you do to the water and gas lines?	<ul style="list-style-type: none"> a. Cap them off and pressure test b. Begin using immediately c. Check for cross connections
5. Who coordinates all work?	<ul style="list-style-type: none"> a. Building custodian b. Project manager c. Each laborer d. Flight Chief

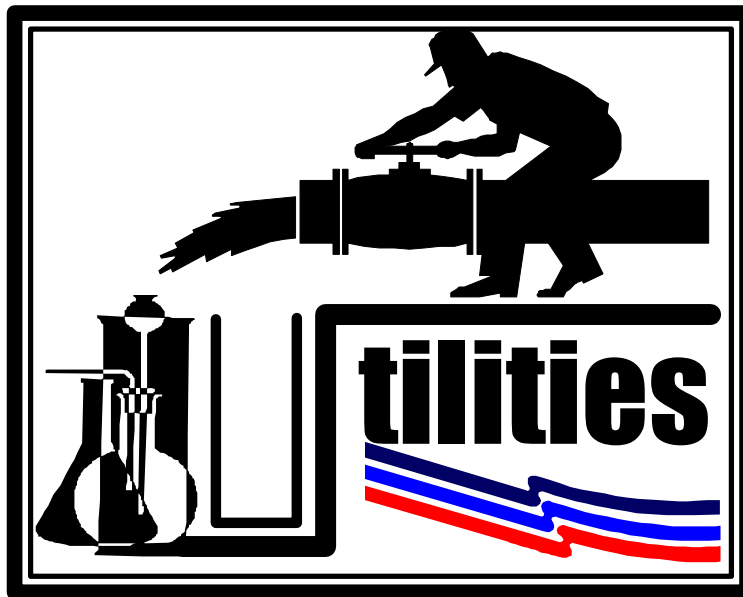
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INSTALLATION PROCEDURE

Performance Checklist		
Step	Yes	No
1. Did trainee identify all types of construction plans? <ul style="list-style-type: none"> Plot plan. Foundation plan. Floor plan. Elevation plan. Mechanical blueprints. 		
2. Did the trainee identify all equipment needed for the job? <ul style="list-style-type: none"> Rough-in location. Size and type of piping. Fixtures. Fittings. Valves. 		
3. Did the trainee explain the different symbols on the plan? <ul style="list-style-type: none"> Rough-in locations. Piping materials. Fittings. Valves. Fixtures. 		
4. Did the trainee identify installation procedure? <ul style="list-style-type: none"> Rough-in location. Identified locations, size, and type of line to install. Identified location for installing building plumbing. Conducted pressure test of system. Installed plumbing fixtures. Conduct final test. 		
5. Did the trainee complete all the questions in QTP? <ul style="list-style-type: none"> Score 80% or higher. Did trainer review and explained all missed questions. 		
6. Did the trainee take proper safety precautions?		

FEEDBACK: Trainer should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.

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USE BUILDING CONSTRUCTION PLANS TO IDENTIFY:

MODULE 11

AFQTP UNIT 1

MATERIALS NEEDED (11.1.2.)

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MATERIALS NEEDED***Task Training Guide***

STS Reference Number/Title:	11.1.2., Materials needed
Training References:	<ul style="list-style-type: none"> • CDC 3E451A • AFJMAN 32-1059 • AFI 32-1066 • AFI 32-1070 • Uniformed Plumbing Code
Prerequisites:	<ul style="list-style-type: none"> • Possess as a minimum a 3E4X1 AFSC
Equipment/Tools Required:	<ul style="list-style-type: none"> • Construction plans
Learning Objective:	<ul style="list-style-type: none"> • Trainee will learn to use construction plans to identify materials needed.
Samples of Behavior:	<ul style="list-style-type: none"> • Trainee will be able to use construction plans to identify material requirements.
Notes:	
<ul style="list-style-type: none"> • Steps will be followed in sequence as needed • Any safety violation is an automatic failure 	

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MATERIALS NEEDED

Background: The construction plans you will need to identify materials needed are: Plot plan, foundation plan, floor plan, elevation plan, and mechanical blueprints. From these plans we can identify, size lines, length, and material of pipe material that will be used. Also, the plans indicate what fixtures are needed, and what fittings are required.

NOTE:

It is very important that you be familiar with the plumbing symbols for piping, fittings, valves, and fixtures. A good reference for these symbols would be the trainee's, CDC 3E451A Supplementary Material for Volume 2 (Foldout).

To perform this task, follow these steps:

Step 1: Use legend and identify the piping systems. This should also tell you what kind of material, size and location of pipes you will be working with.

Step 2: Determine how many feet of pipe you will need for each plumbing system by using a scale. (example, $\frac{1}{4}$ inch = 1foot).

Step 3: Identify what fittings you will need for each system.

Step 4: Identify what fixtures you will be installing.

HINT:

Knowing the above steps should help trainee determine "take-off" items such as, PVC Cement, PVC cleaner, solder, flux, propane, plumbers tape, and pipe dope.

**Review Questions
for
Materials Needed**

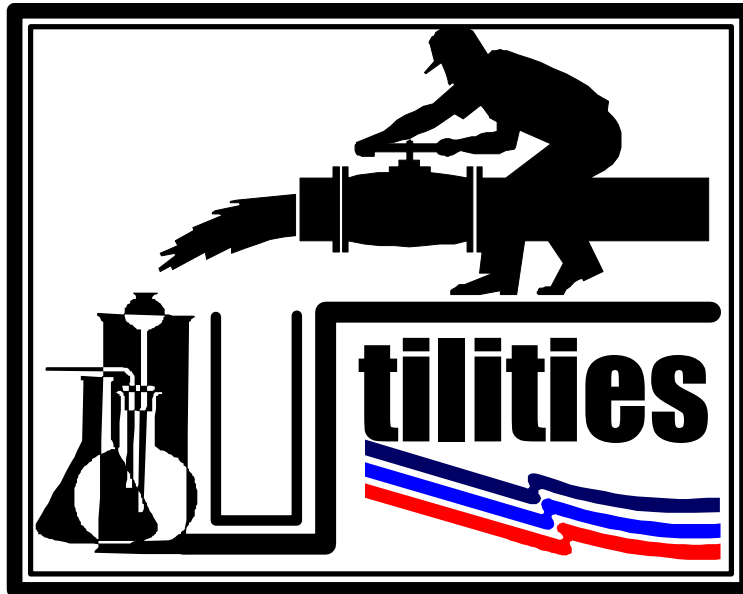
Question	Answer
1. What must you be familiar with in order to identify materials needed?	a. Hand symbols b. Tool symbols c. Arm symbols d. Plumbing symbols
2. What four symbols will help you identify the materials you will need?	a. Colors and shapes only b. Piping, fittings, colors, and shapes c. Piping, fittings, valves, and fixtures d. Piping, fittings, colors, and fixtures
3. After you identify the materials you will need, what items must be considered?	a. Take on items b. Take off items c. Expendable items
4. How do you determine actual length of pipe to install from plans?	a. Use a scale b. Use a tape measure c. Use a straight-edge d. Use a straight scale

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MATERIALS NEEDED

Performance Checklist		
Step	Yes	No
1. Did trainee identify all the equipment needed for the job? <ul style="list-style-type: none"> • Rough-in location. • Size and type of piping. • Fixtures. • Fittings. • Valves. 		
2. Did the trainee follow step-by-step procedure for identifying materials needed? <ul style="list-style-type: none"> • Used legend and identified the piping systems. • Determined how many feet of pipe were needed. • Identified what fittings were needed. • Identified what fixtures were needed. 		
3. Did the trainee remember his/her take-off items? <ul style="list-style-type: none"> • PVC cement • PVC cleaner • Solder. • Flux. • Propane. • Plumbers tape. • Pipe dope 		
4. Did the trainee take proper safety precautions?		
5. Did the trainee complete all the questions in QTP? <ul style="list-style-type: none"> • Score 80% or higher. • Did trainer review and explained all missed questions. 		

FEEDBACK: Trainer should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.



USE BUILDING CONSTRUCTION PLANS TO IDENTIFY:

MODULE 11

AFQTP UNIT 1

TYPES OF SYSTEMS (11.1.3.)

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TYPES OF SYSTEMS***Task Training Guide***

STS Reference Number/Title:	11.1.3., Types of systems
Training References:	<ul style="list-style-type: none"> • CDC 3E451A • AFJMAN 32-1059 • AFI 32-1066 • AFI 32-1070 • Uniformed Plumbing Code
Prerequisites:	<ul style="list-style-type: none"> • Possess as a minimum a 3E4X1 AFSC
Equipment/Tools Required:	<ul style="list-style-type: none"> • Construction plans
Learning Objective:	<ul style="list-style-type: none"> • Trainee will learn to use construction plans to identify types of systems.
Samples of Behavior:	<ul style="list-style-type: none"> • Trainee will be able to use construction plans to identify types of systems.
Notes:	
<ul style="list-style-type: none"> • Steps will be followed in sequence as needed • Any safety violation is an automatic failure 	

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TYPES OF SYSTEMS

Background: The construction plans you will need to identify types of systems are: plot plan, foundation plan, floor plan, and mechanical blueprints. From the legend on the plans we can identify what kind of system we'll be working on.

NOTE:

It is very important that you be familiar with the plumbing symbols for piping. A good reference for these symbols would be the trainee's, CDC 3E451A Supplementary Material for Volume 2 (Fold-out). Using the legend from the construction plans, or from the trainee's fold-out, trainee should be able to identify what kind of system is on the plan.

To perform this task, follow these steps:

Step 1: Obtain the most current set of utility maps from the engineering flight or from maintenance engineering in the operations flight.

Step 2: Locate the facility or the general area where the work will be performed.

Step 3: Select the most appropriate map for the work being performed.

If there is a need to locate service mains, the plot plan will be needed. If building service lines need to be located, the foundation and floor plan would be used. Mechanical blueprints may become necessary if relationships to fixtures and other utilities are desired.

Step 4: Make a note of the description of the pipe on the drawing.

Step 5: Use legend and identify the piping systems you have.

Information should be provided on the length, outer diameter (OD), type, and material of the existing lines.

NOTE:

Plans are only as good as the craftsmen's commitment to update them. Ensure new installation is coordinated with Maintenance Engineering to be added to existing prints. It is not uncommon to find that existing lines have not been accurately represented on the plans.

**Review Questions
for
Types of Systems**

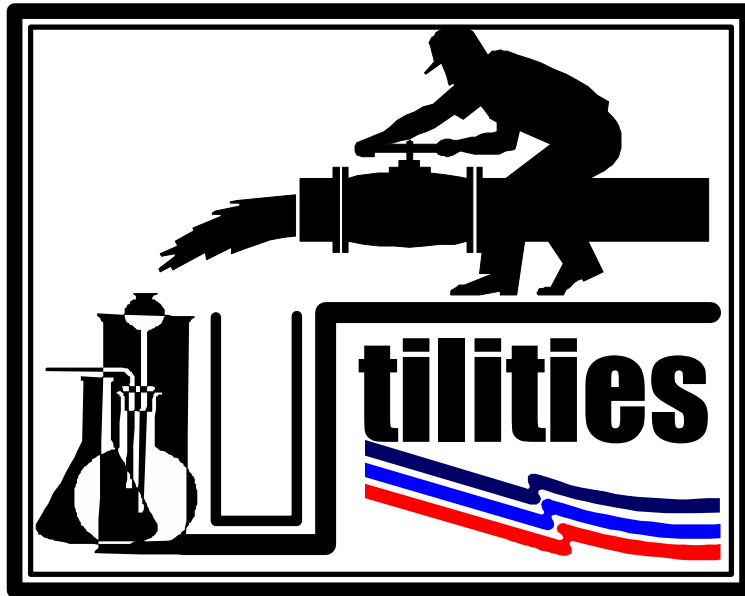
Question	Answer
1. What must you be familiar with in order to identify types of systems?	a. The legend b. A hand sketch c. Radio codes d. Hand signals
2. What symbol will help you identify the type of system you have?	a. Map symbol b. Hand symbol c. Piping symbol d. Distribution symbol
3. What type of plan will reveal existing or planned piping systems?	a. Plot b. Floor c. Foundation d. All of the above
4. Who handles updates on existing plans?	a. BCE b. Operations Commander c. Maintenance Engineering d. Shop Supervisor

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TYPES OF SYSTEMS

Performance Checklist		
Step	Yes	No
1. Did trainee identify all the equipment needed for the job? <ul style="list-style-type: none"> • Rough-in location. • Size and type of piping. • Fixtures. • Fittings. • Valves. 		
2. Did the trainee follow step-by-step procedure for identifying the systems properly? <ul style="list-style-type: none"> • Obtained the most current set of utility maps. • Located the facility or the general area. • Selected the most appropriate map for the work. • Made a note of the description of the pipe on the drawing. • Used legend and identified the piping systems. 		
3. Did the trainee take proper safety precautions?		
4. Did the trainee complete all the questions in QTP? <ul style="list-style-type: none"> • Score 80% or higher. • Did trainer review and explained all missed questions. 		

FEEDBACK: Trainer should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.



PROJECT PLANNING

MODULE 11

AFQTP UNIT 2

PREPARE WORKING SKETCHES (11.2.)

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PREPARE WORKING SKETCHES***Task Training Guide***

STS Reference Number/Title:	11.2., Prepare working sketches
Training References:	<ul style="list-style-type: none"> • CDC 3E451A • AFJMAN 32-1059 • AFI 32-1066 • AFI 32-1070 • Uniformed Plumbing Code
Prerequisites:	<ul style="list-style-type: none"> • Possess as a minimum a 3E431 AFSC
Equipment/Tools Required:	<ul style="list-style-type: none"> • Paper, Pencil, Knowledge of a system
Learning Objective:	<ul style="list-style-type: none"> • To know the three types of working drawings
Samples of Behavior:	<ul style="list-style-type: none"> • Trainee will demonstrate the three types of working drawings by drawing sketches of each.
Notes:	
<ul style="list-style-type: none"> • Steps will be followed in sequence as needed 	

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PREPARE WORKING SKETCHES

Background: As a Utilities Systems Journeyman, you will need to make sketches or working drawings of plumbing systems to work from. This will help compile a list material needed to do a job. These sketches also help you explain the plumbing system or problem(s) to a co-worker or your boss. A working drawing includes all piping, fittings, fixtures, and dimensions. There are three types of working drawings: the top or plan view (Figure 1); side view (left or right end elevation), and isometric view (sectional or “cut-away”). The top view is the most commonly used working drawing. All others are used when information cannot be clearly given in a top view. A working drawing can be made from the blueprint of an existing system. Remember to include all of the information needed to do the job.

NOTE:

In the cases of repair and maintenance, it is highly encouraged that the craftsman actually visits the job site to verify existing information. Do not always rely on prints as the absolute truth of existing systems.

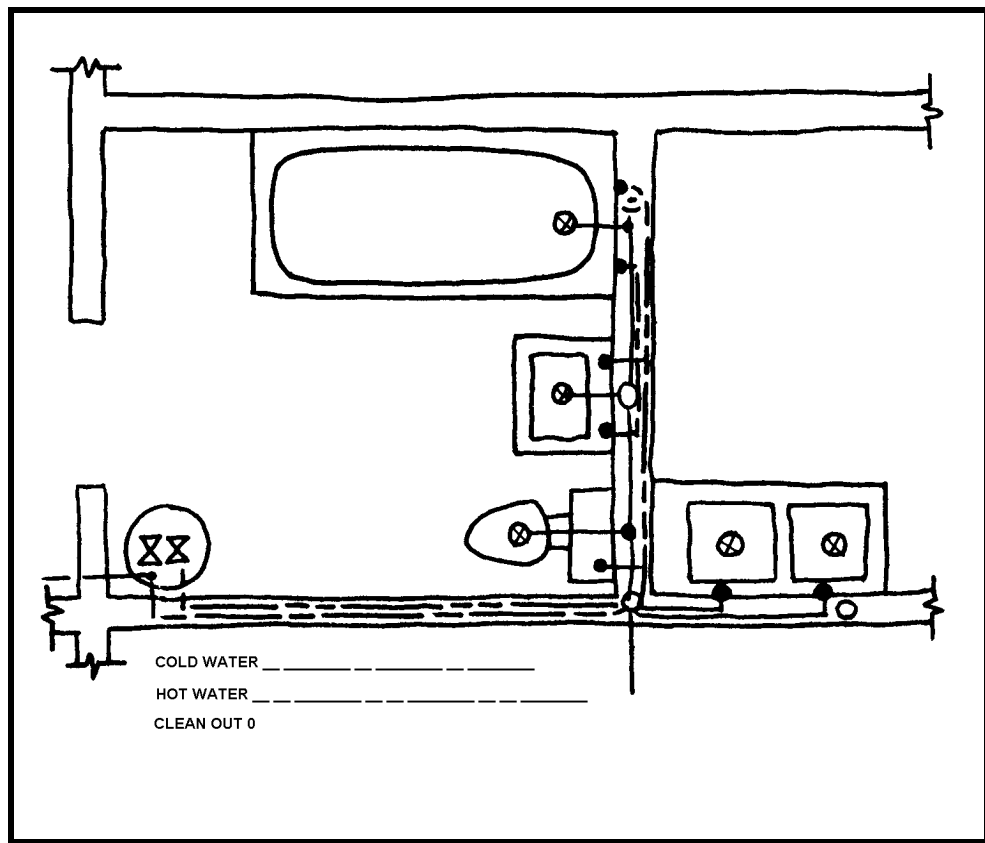


Figure 1, Plan View

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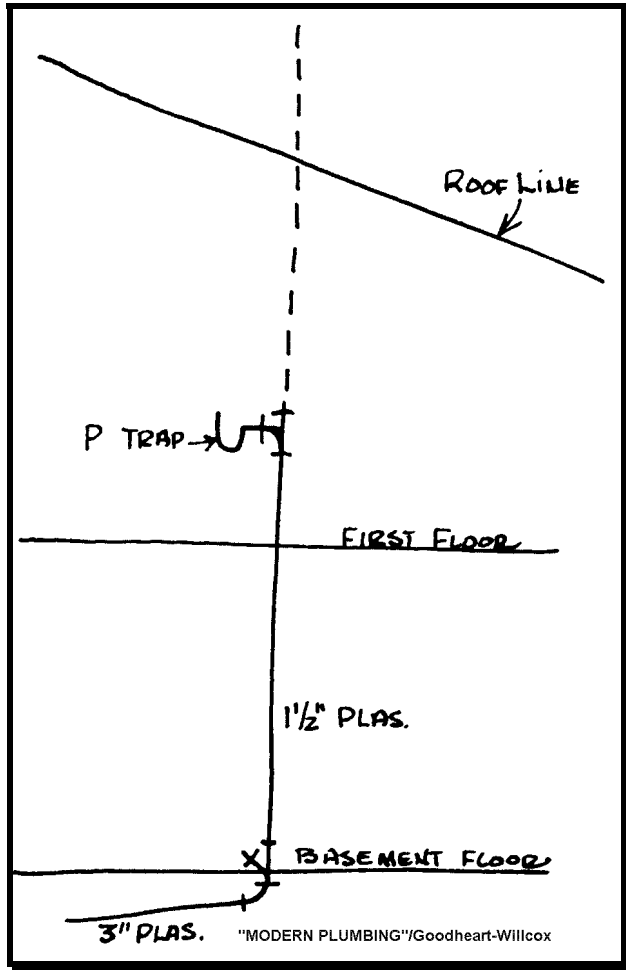


Figure 2
Working Sketch, Existing Elevation

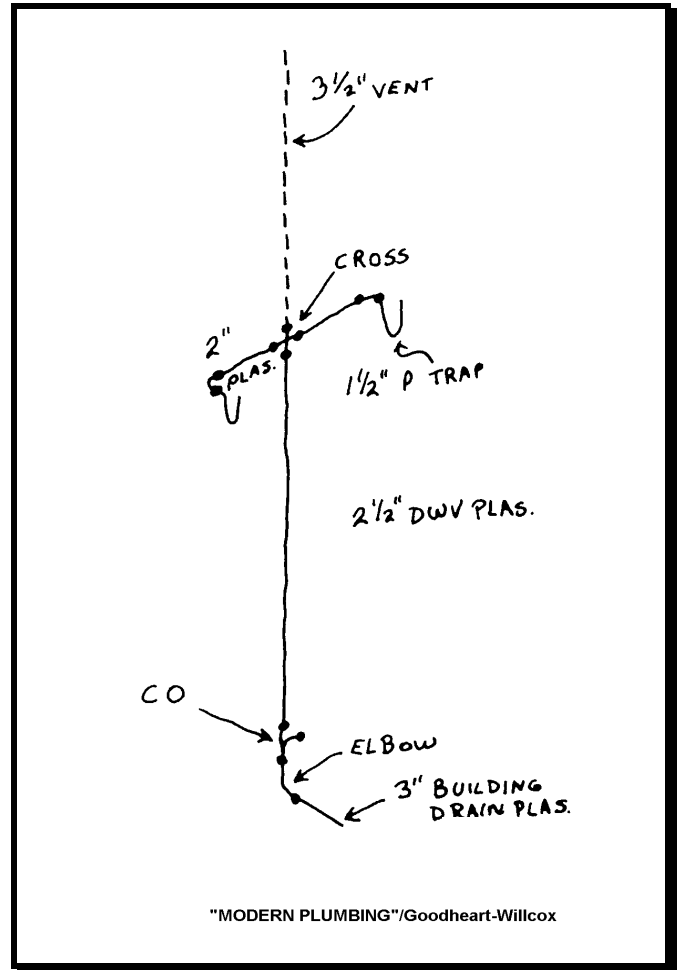


Figure 3
Working Sketch, Corrected Elevation

To perform this task, follow these steps:

- Step 1:** Identify the location where work is to be performed.
- Step 2:** Locate the area on the most current blueprint of the facility.
- Step 3:** Take the blue print (or a photo copy of the facility) to the site and compare the design with what actually exists.
- Step 4:** Using a single line drawing, make a sketch of the existing fixtures and dimensions.
- Step 5:** Sketch-in the corrections and new fixtures, lines, or appurtenances that will be installed.

HINT:

Corrections and new additions should be highlighted or drawn in a different color ink to easily identify changes.

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**Review Questions
for
Prepare Working Sketches**

Question	Answer
1. What are the three types of working drawings?	a. Top view, side view, isometric b. Blue, red, and black lines c. Prints, hand, computerized d. Top view, blue, print
2. When would you use an isometric view working drawing?	a. When ever you want b. When submitting to contracting c. When top view information is unclear d. Never
3. What is the best use of working sketches?	a. Get all information on pipe sizes b. Get all information on pipe material c. Get all information on pipe locations d. Get all information needed to do a job
4. What is the most common type of working sketch?	a. Top view b. Side view c. Isometric view d. All are equally common

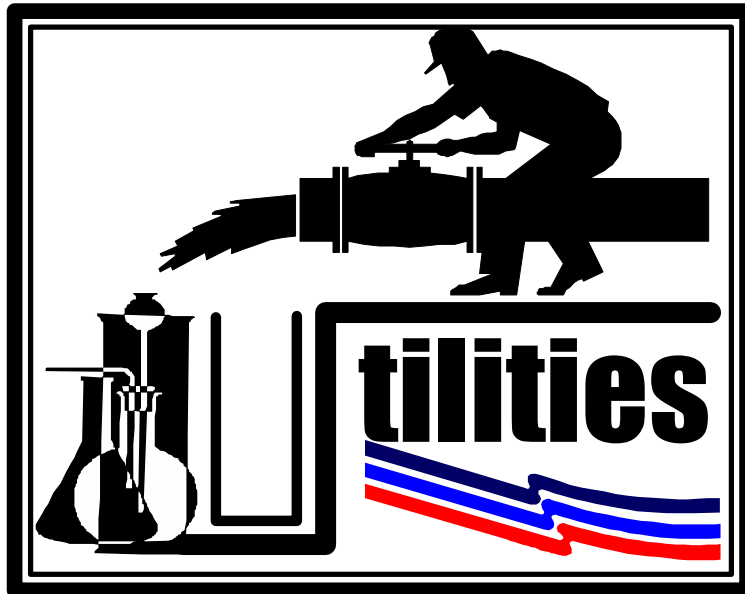
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PREPARE WORKING SKETCHES

Performance Checklist		
Step	Yes	No
1. Did the trainee know the three types of working sketches? <ul style="list-style-type: none"> • Top • Side • Isometric 		
2. Did the trainee follow step-by-step procedure for a working drawing? <ul style="list-style-type: none"> • Identified the location where work is to be performed. • Located area using most current blueprint. • Compared blueprint with what actually exists. • Made sketch of the existing fixtures and dimensions. • Sketched in corrections and new fixtures, lines, or appurtenances that will be installed. 		
3. Did trainee include all items in the working drawing? <ul style="list-style-type: none"> • Rough-in location. • Size and type of piping. • Fixtures. • Fittings. • Valves. 		
4. Did the trainee complete all the questions in QTP? <ul style="list-style-type: none"> • Score 80% or higher. • Did trainer review and explained all missed questions. 		

FEEDBACK: Trainer should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.

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PROJECT PLANNING

MODULE 11

AFQTP UNIT 3

PREPARE AND USE AF FORM 103, WORK CLEARANCE REQUEST (11.3.)

Notice. This AFQTP is NOT intended to replace the applicable technical references nor is it intended to replace hands-on training if equipment is available. It is to be used in conjunction with these for training purposes only.

PREPARE AND USE AF FORM 103, WORK CLEARANCE REQUEST***Task Training Guide***

STS Reference Number/Title:	11.3., Prepare and use AF Form 103, Work Clearance Request
Training References:	<ul style="list-style-type: none"> • CDC 3E451A • AFJMAN 32-1059 • AFI 32-1066 • AFI 32-1070 • Uniformed Plumbing Code
Prerequisites:	<ul style="list-style-type: none"> • Possess as a minimum a 3E431 AFSC
Equipment/Tools Required:	<ul style="list-style-type: none"> • AF FORM 103/PHONE #'S
Learning Objective:	<ul style="list-style-type: none"> • Know the proper procedures to fill out a AF Form 103
Samples of Behavior:	<ul style="list-style-type: none"> • Trainee will demonstrate the proper way of filling out an AF Form 103.
Notes:	
<ul style="list-style-type: none"> • Steps will be followed in sequence as needed 	

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PREPARE AND USE AF FORM 103, WORK CLEARANCE REQUEST

Background: AF Form 103s are required before you do any work that requires dig more than four inches in depth. This form is commonly referred to as a “digging permit”. Your job could be to initiate a digging permit or simply “sign-off” (coordinate) in the appropriate areas. If you are the requester you will fill out blocks 1-7. Various CE personnel will fill their appropriate information or coordination in block 8. Your supervisor will let you know if you are authorized to sign this form.

To perform this task, follow these steps:

Step 1: Obtain Direct Scheduled Work (DSW) order number or Work Order (W/O) number.

Step 2: Complete items 1-7 on the 103. For a local copy use the hyper link below.
<http://afpubs.hq.af.mil/elec-products/fmpages/af/af0100-0199.stm>

Step 3: Contact all persons concerned with items 8-14 on the 103, and set up a meeting time.

NOTE:

A local copy of an AF Form 103 can be pre-made with all the phone numbers preprinted on the form.

Step 4: Meet all persons concerned at the excavation site.

In emergency situations, some foremen may clear their section over the phone; however, this is not preferred because of miscalculations and misunderstandings of exact locations.

NOTE:

If you get clearance over the phone be sure to put down who you talked with, time and date. You will need this information later.

Step 5: After all the signatures have been obtained, you must get the digging permit approved.

This could be performed by the Chief of Operations, Chief of Engineering, another designated official.

NOTE:

Blocks 9 and 12 do not have to be filled out if you are not blocking a road or working in the vicinity of the flight line. The approval authority for blocks 9 and 12 is the Security Forces

SAFETY:

DO NOT ASSUME THAT OTHER LINES ARE NOT IN THE AREA. THIS COULD BE YOUR WORST MISTAKE. YOU COULD DIG UP GAS LINES, OR EXPENSIVE COMMUNICATION LINES.

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**Review Questions
for
Prepare and use AF Form 103, Work Clearance Request**

Question	Answer
1. What is the form number of a digging permit, or work clearance request?	<ul style="list-style-type: none"> a. AF Form 109 b. AF Form 106 c. AF Form 103 d. None of the above
2. Who can authorize you to sign blocks 8c , 8e, 8h on a work clearance request?	<ul style="list-style-type: none"> a. Only the Ops Chief b. The shop supervisor c. The Maintenance Engineer d. Maintenance Ops supervisor
3. What will you fill out if you are the requester?	<ul style="list-style-type: none"> a. Blocks 1-7 b. Blocks 8-12 c. Blocks 13-20 d. Requesters don't complete permits
4. Who must sign the digging permit if you are going to close off a road?	<ul style="list-style-type: none"> a. The Security Police in block 9 b. The Fire Department in block 9 c. The Ops Chief in block 9 a. The Shop Supervisor

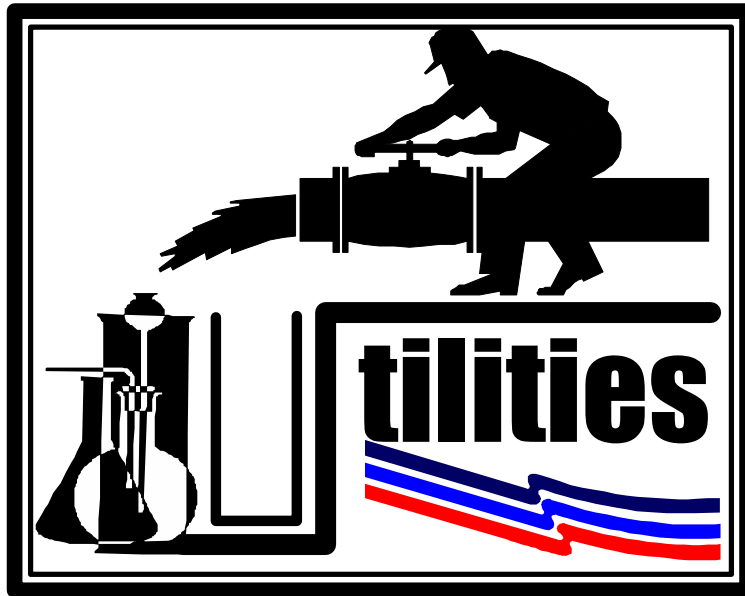
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PREPARE AND USE AF FORM 103, WORK CLEARANCE REQUEST

Performance Checklist		
Step	Yes	No
1. Did trainee know the correct procedures to fill out the AF Form 103? <ul style="list-style-type: none"> • Obtained Direct Scheduled Work (DSW) order or Work Order (W/O) number. • Completed items 1-7 on the 103. • Contacted all persons concerned with items 8-14 on the 103, and set up a meeting time. • Meet all persons concerned at the excavation site. • Received approval signature. 		
2. Did the trainee properly coordination through Base Civil Engineer? <ul style="list-style-type: none"> • Electrical Distribution • Steam Distribution • Water Distribution • POL Distribution • Sewer Distribution • Environmental • Pavements/Grounds • Fire Protection • Zone _____ • Other (Specify) 		
3. Did the trainee properly coordination through Base Civil Engineer? <ul style="list-style-type: none"> • Security Police (if needed) • Safety • Communications • Base operations (if needed) • Cable TV • Commercial Utility Company <ul style="list-style-type: none"> • Telephone • Gas • Electric 		
4. Did the trainee complete all the questions in QTP? <ul style="list-style-type: none"> • Score 80% or higher. • Did trainer review and explained all missed questions. 		

FEEDBACK: Trainer should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.

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PROJECT PLANNING

MODULE 11

AFQTP UNIT 4

PREPARE BILL OF MATERIAL REQUEST (11.4.)

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PREPARE BILL OF MATERIAL REQUEST***Task Training Guide***

STS Reference Number/Title:	11.4., Prepare bill of material request
Training References:	<ul style="list-style-type: none"> • CDC 3E451A • AFJMAN 32-1059 • AFI 32-1066 • AFI 32-1070 • Uniformed Plumbing Code
Prerequisites:	<ul style="list-style-type: none"> • Possess as a minimum a 3E4X1 AFSC
Equipment/Tools Required:	<ul style="list-style-type: none"> • Construction plans, commercial manual
Learning Objective:	<ul style="list-style-type: none"> • Trainee will learn to prepare a bill of materials request.
Samples of Behavior:	<ul style="list-style-type: none"> • Trainee will be able to successfully and safely prepare a bill of material request.
Notes:	
<ul style="list-style-type: none"> • Steps will be followed in sequence as needed • Any safety violation is an automatic failure 	

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PREPARE BILL OF MATERIAL REQUEST

Background: A bill of materials (BOM) is a tabulated list of materials for a job showing the name, description, stock number, quantity, size, and sometimes, the cost of the different items. The construction plans you will need to prepare a BOM are: Plot plans, foundation plans, floor plans, elevation plans, and mechanical blueprints. From these plans you can identify what size lines, how many feet of pipe, and what kind of pipe material to use. Also shown are the fixtures needed, take-off items, and the required fittings.

NOTE:

It is very important that you be familiar with the plumbing symbols for piping, fittings, valves, and fixtures. A good reference for these symbols would be the trainee's, CDC 3E451A Supplementary Material for Volume 2 (Fold-out).

To perform this task, follow these steps:

Step 1: Use legend and identify the components and appurtenances of the existing piping system.

Step 2: Calculate the quantity and lengths of pipe you will need for each plumbing system.

Step 3: Identify what fittings you will need for each system.

Step 4: Note the fixtures you will be installing or replacing.

HINT:

Knowing the above steps should help you determine take-off items such as, PVC Cement, cleaner, solder, flux, propane, plumbers tape, and pipe dope.

Step 5: Make a list of all fittings, fixtures, take-off items, and piping you will need for each type of system you will be working on.

Step 6: Compile the list together including name, description, stock number, quantity, size, and estimated cost of each item.

Step 7: Once the list is complete you're ready to input items into the computer BOM system. Obtain work order or direct schedule work order number first. Consider including an RDD (required delivery date). This will depend on the priority and urgency of the work.

Step 8: Once an RDD is entered, the BOM can be electronically sent to Material Control or appropriate supply channel for ordering.

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**Review Questions
for
Prepare Bill of Material Request**

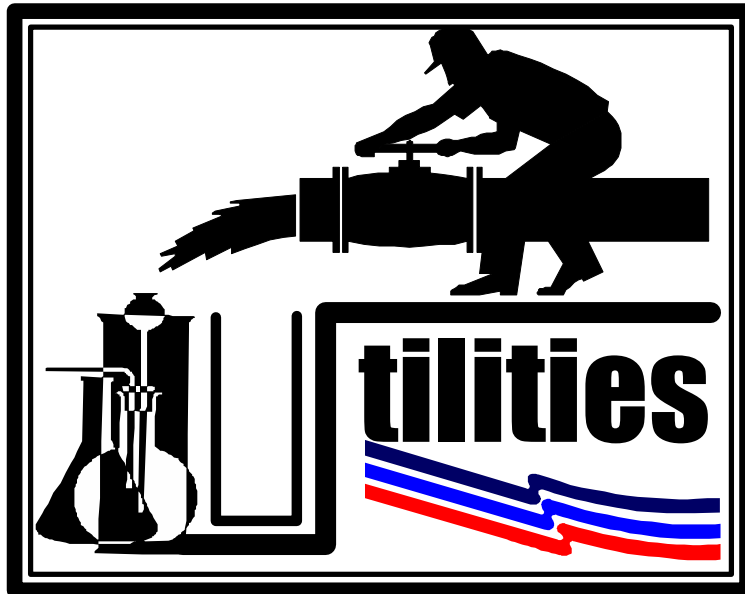
Question	Answer
1. What must you be familiar with in order to identify materials needed?	<ul style="list-style-type: none"> a. Stock prices b. Local prices c. Stock class codes d. Plumbing symbols
2. What four symbols will help you identify the materials you will need?	<ul style="list-style-type: none"> a. Colors, shapes, lines, and letters b. Piping, fittings, valves, and fixtures c. Numbers, letters, colors and shapes d. Numbers, piping, letters, and shapes
3. After you identify the materials you will need what items must be considered?	<ul style="list-style-type: none"> a. Take on items b. Take off items c. Local substitutions d. Immediate substitutions
4. What should be done after list is complete?	<ul style="list-style-type: none"> a. Include an RDD b. Note an ARD c. State an ODD d. Include an ADD
5. After a delivery date has been given where is the bill of material sent?	<ul style="list-style-type: none"> a. To Material Control for ordering b. To local vendors for distribution c. To your supervisor for coordination d. Keep the BOM for further coordination

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PREPARE BILL OF MATERIAL REQUEST

Performance Checklist		
Step	Yes	No
1. Did the trainee follow step-by-step procedure for a Bill of Material Request? <ul style="list-style-type: none"> • Identified components and appurtenances of the existing piping system. • Calculated quantity of pipe will needed for each plumbing system. • Identified fittings for each system. • Noted fixtures that would be installed or replaced. • Made a list of fittings, fixtures, take-off items, and piping needed for each type of system. • Compiled a list together including name, description, stock number, quantity, size, and estimated cost of each item. • Inputted items into the BOM computer system. Obtained work order or direct schedule work order number first. Considered including an RDD (required delivery date). • Sent BOM electronically to Material Control. 		
2. Did the trainee take proper safety precautions?		
3. Did the trainee complete all the questions in QTP? <ul style="list-style-type: none"> • Score 80% or higher. • Did trainer review and explained all missed questions. 		

FEEDBACK: Trainer should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.



PROJECT PLANNING

MODULE 11

AFQTP UNIT 5

RECOVERY MATERIALS (11.5.)

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RECOVERY MATERIALS

Task Training Guide

STS Reference Number/Title:	11.5., Recovery materials
Training References:	<ul style="list-style-type: none"> • Shop policies
Prerequisites:	<ul style="list-style-type: none"> • Possess as a minimum a 3E431 AFSC
Equipment/Tools Required:	<ul style="list-style-type: none"> • Storage Bins
Learning Objective:	<ul style="list-style-type: none"> • Know shop policies for the turn in of recyclable material
Samples of Behavior:	<ul style="list-style-type: none"> • Trainee will know what types of materials are recyclable.
Notes:	

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RECOVERY MATERIALS

Background: Just about all materials today are recyclable. Recycling procedures vary base to base, but at a minimum, every area should have several recycling collection bins. Metals that will be recovered, should be identified, label and place containers for copper, brass, steel, and any other metals. When recovering materials, recyclable materials must be separated form non-recyclable materials. An example of this is a flushometer. When a flushometer is replaced, the old one will need to be stripped of its plastic components while the brass body can be placed in the recycling bin. If piping is included, it must be stripped of any insulation and separated if there are differences in material. Days and times should be set up for collection and turn-in of the collection bins. A collection point manager should coordinate disposition of recovery materials in your unit. An AF Form 1348-1, or a 2005 may be used for turn into the Defense Reutilization Management Office (DRMO).

SAFETY:

IF YOU SUSPECT AN ITEM TO BE HAZARDOUS DO NOT HANDLE IN A NORMAL MANNER. CONSULT WITH SUPERVISOR OR HAZARDOUS WASTE MONITOR FOR PROPER TURN IN PROCEDURES. ASBESTOS IS JUST ONE EXAMPLE OF HAZARDOUS MATERIAL.

To perform this task, follow these steps:

Step 1: Identify items to be recycled.

Step 2: Note the quantity, type, and material of the item(s).

Step 3: Locate disposal points or collection centers.

HINT:

If you can't find the disposal locations or procedures, go to your bulletin board and make a note of your Unit Single Point Manager.

Step 4: Prepare, package, bind, or assemble items to be disposed.

Step 5: For some materials, your Unit Single Point Manager may need to be contacted for assistance and coordination.

Step 6: Complete appropriate logs, forms, or records to keep a history of your disposals.

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**Review Questions
for
Recovery Materials**

Question	Answer
1. Who can BEST assist you on the disposal of recoverable items?	a. Your supervisor b. Base Supply c. Unit Single Point Manager d. Base Single Point Manager
2. Very little of the material we use is recyclable.	a. True b. False
3. Where do you turn in material after the collection bins are full?	a. DRMO b. DRUM c. DORM d. Material Control
4. What forms are used for scrap material turn-in?	a. AF Form 1348-1 or 2005 b. AF From 1348-3 or 2005 c. AF Form 1348-6 or 2005 d. AF Form 1348-9 or 2005

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RECOVERY MATERIALS

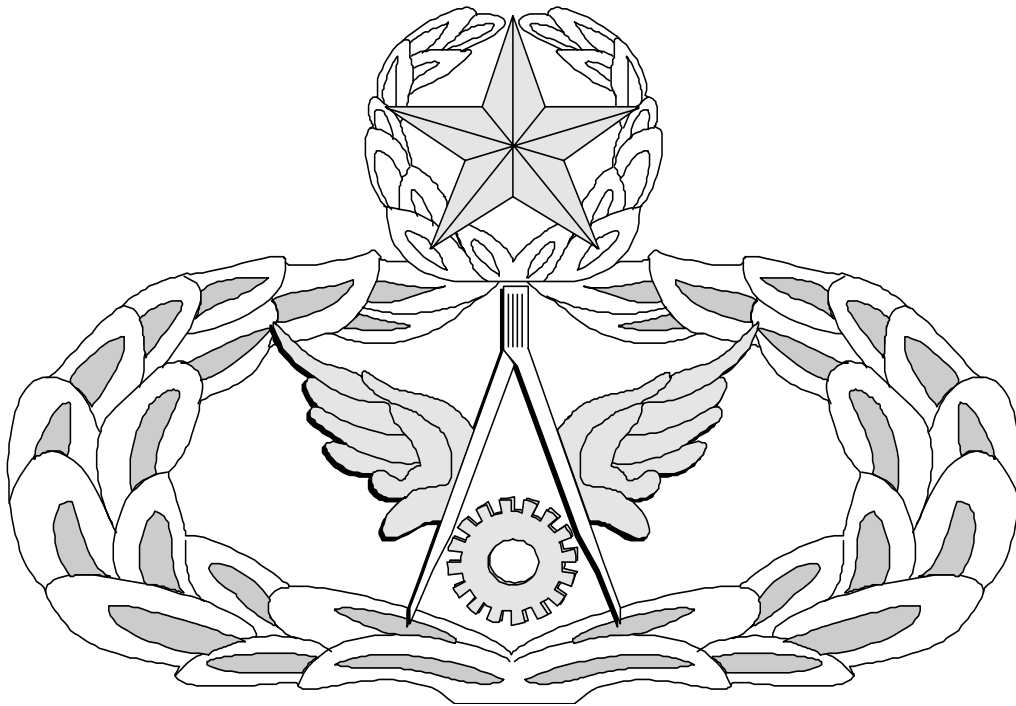
Performance Checklist		
Step	Yes	No
1. Did the trainee follow step-by-step procedure for recovery of materials? <ul style="list-style-type: none"> • Identified items to be recycled. • Noted the quantity, type, and material of the item(s). • Located disposal points or collection centers. • Prepared, packaged, binding, or assembled items to be disposed. • Coordinated with Unit Single Point Manager (if needed). • Completed appropriate logs, forms, or records for a history of disposals. 		
2. Did the trainee complete all the questions in QTP? <ul style="list-style-type: none"> • Score 80% or higher. • Did trainer review and explained all missed questions. 		

FEEDBACK: Trainer should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.

Air Force Civil Engineer

QUALIFICATION TRAINING PACKAGE (QTP)

REVIEW ANSWER KEY



For
UTILITIES SYSTEMS

(3E4X1)

MODULE 11

PROJECT PLANNING

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Key-1

INSTALLATION PROCEDURE

(3E4X1-11.1.1.)

Question	Answer
1. A legend on a drawing is used to?	d. Identify the different lines and symbols shown on the plan
2. A project manager will coordinate with each craft for each phase of the installation. You will need to ensure that you have all materials ready to avoid slowing down the project.	a. True
3. After the frame work is completed what is done next?	c. Install building plumbing
4. After building plumbing is completed what should you do to the water and gas lines?	a. Cap them off and pressure test
5. Who coordinates all work?	b. Project manager

MATERIALS NEEDED

(3E4X1-11.1.2.)

Question	Answer
1. What must you be familiar with in order to identify materials needed?	d. Plumbing symbols
2. What four symbols will help you identify the materials you will need?	c. Piping, fittings, valves, and fixtures
3. After you identify the materials you will need, what items must be considered?	b. Take off items
4. How do you determine actual length of pipe to install from plans?	a. Use a scale

TYPES OF SYSTEMS

(3E4X1-11.1.3.)

Question	Answer
1. What must you be familiar with in order to identify types of systems?	a. The legend.
2. What symbol will help you identify the type of system you have?	c. Piping symbol
3. What type of plan will reveal existing or planned piping systems?	d. All of the above
4. Who handles updates on existing plans?	c. Maintenance Engineering

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PREPARE WORKING SKETCHES

(3E4X1-11.2.)

Question	Answer
1. What are the three types of working drawings?	a. Top view, side view, isometric
2. When would you use an isometric view working drawing?	c. When top view information is unclear
3. What is the best use of working sketches?	d. Get all information needed to do a job
4. What is the most common type of working sketch?	a. Top view

PREPARE AND USE AF FORM 103, WORK CLEARANCE REQUEST

(3E4X1-11.3.)

Question	Answer
1. What is the form number of a digging permit, or work clearance request?	c. AF Form 103
2. Who can authorize you to sign blocks 8c , 8e, 8h on a work clearance request?	b. The shop supervisor
3. What will you fill out if you are the requester?	a. Blocks 1-7

PREPARE BILL OF MATERIAL REQUEST

(3E4X1-11.4.)

Question	Answer
1. What must you be familiar with in order to identify materials needed?	d. Plumbing symbols
2. What four symbols will help you identify the materials you will need?	b. Piping, fittings, valves, and fixtures
3. After you identify the materials you will need what items must be considered?	b. Take off items
4. What should be done after list is complete?	a. Include an RDD
5. After a delivery date has been given where is the bill of material sent?	a. To Material Control for ordering

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RECOVERY MATERIALS

(3E4X1-11.5.)

Question	Answer
1. Who can BEST assist you on the disposal of recoverable items?	c. Unit Single Point Manager
2. Very little of the material we use is recyclable.	b. False
3. Where do you turn material after the collection bins are full ?	a. DRMO
4. What forms are used for scrap material turn-in?	a. AF Form 1348-1 or 2005

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